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Assessing Quality Design of Interiors: A case study of a Hospital Outpatient Unit in Malaysia

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Abstract

Assessment on the physical design of healthcare facilities from the perspective of the patient and their family members (user) is the method to understand their expectation, preferences and experiences. This paper reports the study conducted on an outpatient unit in Malaysia, focusing particularly on the interior design characteristics. The study adopted post occupancy evaluation technique that combines baseline analysis, occupancy survey and walkthrough observation methods. The study findings indicate that the case study which has served the public for more than 20 years ago is performing moderately on all interior design aspects. Users' assessments did not score any of the facility "good" in terms of their interior quality, suggesting the desire for improvement to the current facility.

Keyword: Quality design; interior design aspects; outpatient health care; outpatient facilities

1. Introduction

In many parts of the world, demand for inpatient care has continued to reduce from year to year, and correspondingly the trend is towards increased reliance on outpatient healthcare (Carr, 2011). Likewise in Malaysia, the statistics has shown similar drastic increment (MOH,2009) which prompted the government

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to plan and build more new outpatient centres (Bernama, 2009). It is timely to assess the current state of outpatient facilities in the country to understand how well they serve the users.

Hospital outpatient service is an important component in a medical care delivery. The facility that houses these services in the public hospitals in Malaysia, is referred to as Outpatient Unit. It provides primary care that focuses on preventive and public health care services. Subsidized by the government these facilities serve and appeal especially to the economically disadvantaged population.

Assessment of occupied buildings is essential to reveal design solutions that work as well as those that do not. It has been observed that assessment of outpatient facilities has remained unexplored as health care researches have focused mainly on acute and inpatient care (Preiser et al., 2009). As a contribution, to fill this void, Preiser et al. (2009) conducted 5 case studies of community outpatient facilities in the USA. The study outcome was a design guide that is patients-centered, providing health care environment which articulate issues relating to site planning, wayfinding, amenities, and the internal deployment of diagnostic and treatment functions.

As observed by Franklin et al. (2008) there have been few attempts to identify the performances of individual elements of physical environments (Franklin et al, 2008). While there are some foreign researches focusing on the waiting time, very few has examined on the interior design characteristic which support the clinical process in the outpatient area. This paper reports a post occupancy study conducted on an outpatient unit in Malaysia, focusing particularly on the interior design characteristics. It serves as an initial step towards collating performance studies for the purpose of deriving an evident-based design guide for outpatient care interior architecture.

2. Literature review

The definition and aspects of quality interiors have been described by many. According to Ching (2005) interior spaces within buildings are defined by the architectural elements of structure and enclosures which include floors, ceilings, walls, windows, doorways, and stairways. Interior elements are fit for visual and functional purposes that incorporate aspects of materials, construction, and technology. They make the interior spaces habitable-functional fit, aesthetically pleasing and psychologically satisfying for activities. In a similar tone, the American Society of Interior Design (ASID), describes the essence of Interior Design as functional, as well as an enhancement of the quality of life and culture of the occupants. Interior Design Manual (2008) elaborates further that the quality dimensions of interior design are to include productivity, health protection, safety and welfare of the space users.

Ulrich (1991) opined that healthcare interiors have been designed primarily with functional emphasis that tends to create the environment that negates the psychological needs of patients, visitors, and staff. The results are facilities which he regards to be psychologically “hard” that could be stressful to users. According to Dijkstra et al. (2006) design conditions that promote the betterment of users’ health and wellbeing should include the use of colour, furniture, application of art and lighting. Ghazali and Abbas (2011) recommended a more comprehensive consideration to create healing interior which include safety, ergonomics, colour, artwork, lighting, outside view, furniture and furnishings, ambience and therapies.

3. Research method

Many past researches have used Post Occupancy Evaluation (POE) technique to assess performance of occupied buildings especially health projects, for example, Carthey (2006) and Preiser (2009). Approaches to POE studies varied according to the intensity of the investigation (Presier, 1989) due to the time frame (Isaac et al. 2009), its purpose (Vischer, 2005) and availability of fund (Mastor and Ibrahim, 2010). This research employed this technique to gather information of the facility and feedback from

users. Taking an indicative approach, this paper presents the initial results. Data was collected in three stages:

Stage 1: Background information and design characteristics, gathered from Head of the Outpatient Unit and personnel. Drawings of the Unit layout were analysed and diagramming drawn.

Stage 2: Walkthrough observations were conducted for two days duration, recorded using note pad and digital camera.

Stage 3: Feedback from patients and visitors was gathered using occupant survey form. A questionnaire for this survey was formulated through the process of review and modification of several past user satisfaction survey forms particularly by Picker Institute, USA and Institute for Research in Construction (National Research Council Canada). The questions were narrowed down, focusing on interior design aspects clustered as space planning, ergonomics, accessibility, way finding, material and finishes, colour, lighting, furniture and safety. The rating scale is 1: worst, 2: bad, 3: neutral, 4: good and 5: best. The distribution of the questionnaire to the patient and their family members was completed in two months.

4. Case study characteristics

The case study is referred to in this paper as RUKA 1. RUKA 1 is a component of an outpatient unit of a government hospital in Malaysia. The hospital was established in 1987 and provided medical care for the Klang valley area. According to 2009 Annual Report the hospital served a total number of 879,862 outpatients and 466,977 inpatients. This clinic alone had served 139,317 of patients in 2009. Typically a patient seeking for treatment will go through the process of registration, waiting prior to consultation with the doctor, and a second wait to collect the medicine. This area is divided into five areas: drop off, registration counter, waiting area, consultation rooms and pharmacy. Since its operation, the facility has attracted a growing number of patients annually, however, no major renovation has been carried out.

The clinic is divided into two floors - total are on the ground and first floor is 1034 m² and 598 m² respectively. Essentially there are three main zoning of interior spaces that serve the patients – the reception lobby, the consultation area and the pharmacy area. Each of this area has seating provisions for waiting. Ground floor is where the drop off, registration counter, consultation area and pharmacy are located. The drop off (128 m²) area is the arrival point particularly for assisted-patients or those on wheel chair. The distance from the drop off point to the main entrance door is 18 meter. The door is three panes double door swing type. There is a counter for pick-ups of wheel chairs located just outside the entrance door. The registration counter (46 m²) greets patients upon entering the main door. The registration area faces the waiting area (216 m²) which is positioned in the centre of the clinic. These areas also function as the lobby to the outpatient unit. The total floor area is 216 m², with 144 m² of the space serves as walkways and circulation which leaves 72 m² as the seating area.

The staircase and a lift that bring patients to the first floor are next to the registration lobby. The consultation area is on the left of the registration lobby. The total area of the consultation area is 598 m² provided with one counter, 16 consultation rooms (12 m² each room), centralized waiting area (228 m²), one staff room (30 m²), one treatment room (32 m²) and two toilets (36 m²). The toilet is located next to the staircase, with three cubicles for each toilet. Four-sided enclosed courtyard (80 m²) is located in the centre of the area providing natural lighting for both ground floor and first floor. The courtyard is not made accessible to the public. The first floor layout is a repeat of the consultation area on the ground floor except that it only has 15 designated consultation rooms.

The pharmacy area is located on the right side of the registration lobby. It has a waiting area of 108 m², located next to the exit door. This door also leads patients to the extension of pharmacy waiting area located outside of the area. This area is an extension built in from the original design which used to function as a corridor space leading to the specialist clinics and ward area of the general hospital. The

pharmacy counter shared with the payment counter but it was separated and located at the corner in between registration counter and pharmacy area facing the lift lobby. Seating at the pharmacy area is relatively more spacious compared to the one in the registration lobby. The pharmacy provides service for specialist clinic and outpatient clinic (RUKA 1). The clinic uses calling number system, so patients need not queue up for long.

5. Survey analysis

A total of 401 patients responded to this survey. The survey was conducted in the month of January and February 2011. Respondents comprise a good mix of the three ethnic groups in Malaysia - Malay, Chinese, and Indian.

Table 1: Overall scoring for survey items

		Healthcare Facilities						
		Drop off	Registration Counter	Waiting Area	Consultation Room	Pharmacy	Toilet	Overall mean
Design Aspect	Space Planning	3.39	3.36	3.20	3.50	3.29	3.4	3.4
	Accessibility	3.44	3.65	3.52	3.45	3.29	3.68	3.4
	Ergonomics	3.33	3.21	3.33	3.24	3.27	2.99	3.2
	Way Finding	3.69	3.24	3.25	3.32	3.26	3.22	3.3
	Safety	3.02	3.12	3.00	3.3	3.1	2.69	3.0
	Colour	2.93	2.96	3.06	3.21	3.06	3.04	3.0
	Lighting	3.7	3.60	3.27	3.45	3.30	3.43	3.5
	Comfort	3.29	2.74	3.27	3.35	3.31	3.17	3.2
	Material & Finishes	3.19	2.98	3.11	3.2	3.16	2.87	3.1
	Overall mean	3.3	3.2	3.2	3.3	3.2	3.2	3.2

Notes: Rating scale, 1= Worst, 2= Bad, 3= Neutral, 4= Good, 5= Best. Scoring below neutral (<3) are highlighted in bold.

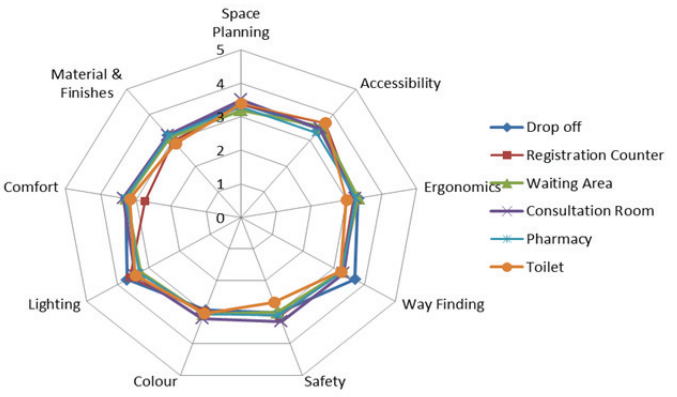


Figure 1: Overall rating according to each design aspect for the respective spaces

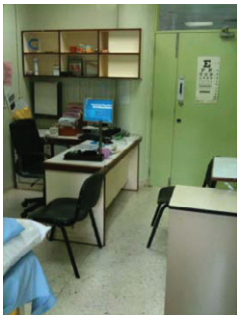
As illustrated in Table 1 and Figure 1, the results indicate that a majority of the respondent rated the design aspects of each area within the neutral range with an average rating between 3.17 and 3.23. None of the spaces received 'good' and above rating (above 4). In terms of comfort, the registration counter area scored the lowest (2.74) and the consultation rooms scored highest (3.35). On the overall, the registration area and toilet area were scored lowest whereby 3 out of the 9 design aspects were rated below neutral. Relatively waiting area, consultation room and pharmacy areas received better scoring as they received above neutral scoring for all design aspects. Highest rating was lighting (3.5), followed by space planning (3.4), accessibility (3.4) and way finding (3.3). Ergonomic (3.2), comfort (3.2), safety (3.0), finishes & materials (3.1) and color (3.0) were rated fair. Based on this result, it can be concluded that patients and visitors find the overall performance of the facility to be acceptable but fair in meeting their satisfaction needs.

6. Walkthrough observation

Observations and commentaries of the facility are summarised in the following table.

View of area	Walkthrough observation
	**Drop off** This area allows drivers to drop off patients. Patients who require wheel chair will have to collect it from a station located at the main entrance. The station is located quite far from the drop off point which means that a patient cannot perform this task on their own and will have to be assisted. Seats are available for waiting visitors. This area tends to be congested at peak hour with overcrowding of patients and visitors arriving and departing the clinic. The hospital provides guards as crowd control and smoothes the process. This is an open area where no additional artificial lighting is needed. The color and pattern of floor finishes in this area are neutral and subdued. *Observation* There is no signage marking to guide visitors into the facility which can be troublesome for first timers. and seating was provided in this area but with limited units. Grab bar need to be provided for physically weak patients
	**Main entrance** The station to collect wheel chair is located just before the main entrance door. There is no proper allocated area to keep the wheel chair. There are three entrance doors, but only two are in use. The other door is closed at most occasions as it is hoarded with additional seatings in the inside space (waiting area). ***Observation*** Floor pattern at this area should be used to mark and this can help patients to navigate them to the main entrance door. Application of color can enhance this area. A proper area to store wheel chair and counter could be located nearer to the drop off area to improve the visual impact. Grab bar should be provided for weak patients to hold as they walk through this area.
	Registration lobby: Counter and waiting area There is only one counter to serve patients for registration and payment purposes. The counter is located at the center of the clinic to capture the flow between consultation area and pharmacy area. There is no separation between the ill and the healthy visitors. There are days when the clinic is congested and in order to cater for more seats during the peak time, the management would close one of the doors at the main entrance. The double volume area allows generous amount of natural light in this area. ***Observation*** The flow of patients from consultation area to pharmacy and registration lobby

tends to suffer bottle neck. The design of the counter do not consider patients on wheel chair and assistive devices. There are limited seats which cause family members to stand while waiting. There are only one type of seat, and no consideration for patients with the physical problem and limited ability. Hard floor finishes contributes to the noise in this area.



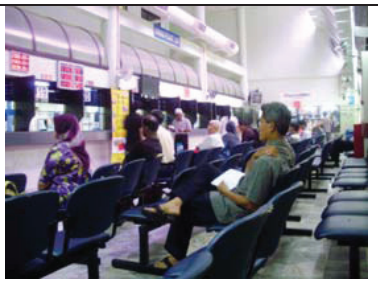
Consultation room

There are 16 consultation rooms on the ground floor and 15 consultation rooms located on the first floor. This centralised waiting area facing the consultation rooms but backing the courtyard. The ground floor consultation area cater for a walk in patient while the first floor was for patient with appointment. There are times when the ground floor area is crowded with patient.

The type of seating for this area do not provide comfort for user, because there are complained from patient regarding the balance when seating on this chair. The waiting area accept natural lighting from the courtyard and artificial lighting to lit up this area. This room used warm colour and using tiles for finishes. Signage for this area is small for the patient to notice for the room number.

Observation

Seatings appear insufficient. The waiting time in this area is considered long for patients. Signages are not clearly marked and not located for good visibility properly and clear to patient, this is due to the seating positon. Little effort has been made to play with colors to enhance the space condition. Hard floor finishes contributes to the noise in this area.



Pharmacy

The pharmacy is located between the walkway to the ward and outpatient area. Eventhough there is another exit from the ward and specialist clinic, this area is consider very busy with the patient and visitor to collect their medicine also out of the hospital, and it is very noisy. Using the same material as the reception counter makes the whole interior appear very dull.

There is spoiled seating, and it should be removed to prevent accident in this area. The seating design in this area provide comfort to the user.

Observation

The traffic flow needs improvement. There are a few spots in this area that do not receive a good amount of lighting.

Toilet

Observation

There are no grab bar provisions for physically weak patients. Door size do not cater for wheel chair and patient with assistive devices. Grab bar, safe floor finishes, proper door size are among the important elements that require improvements.

7. Findings

RUKA 1 was built and has served the public for more than 20 years. Both, the users' satisfaction feedback and observational survey provide evident that on the overall the facility performs moderately on all interior design criteria. Users were asked to assess interior design elements in terms of space planning, ergonomics, accessibility, way finding, material and finishes, colour, lighting, furniture and safety. The survey results show that patients and visitors find the overall performance of the facility to be fairly acceptable in meeting their satisfaction needs. However, none of these aspects were ranked "good" and above, suggesting the desire for improvement. Similarly, the observational study highlighted the need for improvement in terms of space planning, quantity and quality of seating provisions, colour, universal design provisions, signage, lighting, floor finishes and accessibility.

8. Discussion and conclusion

The research used post occupancy evaluation technique as the method to determine the performance of a built facility based on users' satisfaction and experiences. Plan analysis was used as a guide in the study of space planning and how users experience the whole clinical process. The walk through observational technique provided a closer investigation to reveal micro aspects of interior design that could be further improved to serve the patients and other users better. As Malaysia prepares itself to become a fully developed nation, the quality of its health care facilities that care for the health and wellbeing of the general public is an area of study that crucially require careful investigation and enhancement. The current research took an indicative approach in studying only one case study. Investigative type of post occupancy evaluation, on more facilities is needed in order to achieve a more comprehensive result to formulate quality interior design guide for outpatient units in the tropics.

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